Report of the Independent Review Panel
To the Minister for Health and Children
Concerning the Birth of Baby Bronagh Livingstone
On 11 December 2002.

20 December 2002.

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- NEHB Procedure: Management of Emergency Transfers for all Obstetrical Mothers from Monaghan/Navan/Dundalk.
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I TERMS OF REFERENCE

The Minister for Health and Children convened a Panel and requested an independent evaluation be carried out of the report of the North Eastern Health Board into the handling of an obstetrical emergency at the Cavan-Monaghan Hospital Group on 11 December 2002.

The members of the Panel were:

- Dr Sean Daly, Master, Coombe Women's Hospital
- Bridget Boyd, Clinical Nurse Manager 3, Neonatal Intensive Care Unit, Coombe Women's Hospital
- Maureen P. Lynott, Management Consultant.

The Terms of Reference of the Panel were:-

1. To consider the report of the NEHB in relation to the incident and to make such further enquiries and conduct such interviews as the Panel considers necessary;

2. To examine the protocols and procedures in place for the handling of obstetrical emergencies at the Cavan-Monaghan Hospital Group, having regard to prevailing standards of best practice, and to examine their application in this case;

3. To report to the Minister on the adequacy of the response by the Hospitals and the Ambulance Service to the incident and to make such recommendations as it sees fit.

II INTRODUCTION AND APPROACH TO THIS REVIEW

On 11 December 2002, Ms. Denise Livingstone, 24 weeks and 6 days pregnant, presented at Monaghan General Hospital (MGH) with labour pains. She was subsequently transferred by ambulance to Cavan General Hospital (CGH), and gave birth en route. The baby, Bronagh Livingstone, died in Cavan General Hospital after arrival.

The task of the Independent Review panel was to verify the facts surrounding this tragic incident, assess the adequacy of procedures in place to ensure safe patient care, and make necessary recommendations consistent with the Terms of Reference.

Background:

A. The North Eastern Health Board (NEHB) established a review group on maternity services in its area, under the chairmanship of Mr. Dermot Condon, which issued its report in November 2000. The terms of reference of the review group were:

> To investigate fully all the options in relation to maternity services in the area of the North Eastern Health Board in the light of current practice, knowledge and developments, both here and abroad;
>
> To involve in this process, obstetricians, anaesthetists, paediatricians, senior nurses, midwives and representatives of user groups in the local communities; and to seek appropriate expert advice from outside the region.

The report, having examined the level of obstetric activity at Monaghan General Hospital, which in 1999 recorded 344 births, advised that consultant-led maternity services at Monaghan should be discontinued as the provision of such services was no longer supported by the recommendations of the Institute of Obstetricians and Gynaecologists. The North Eastern Health

Board was informed by Irish Public Bodies Mutual Insurances Limited at the end of February 2001, that insurance cover was being withdrawn for maternity services at Monaghan General Hospital. As a result, the Board was forced to temporarily suspend maternity services at the hospital.

B. Subsequently, the Board agreed to establish a further review group to investigate all the options fully in relation to maternity services in the Board's functional area. This review group, which was chaired by Mr. Patrick Kinder, reported in October 2001. The group engaged in widespread consultation with medical, nursing and other professionals, as well as users of the service. The Board adopted the Kinder report and established a task force in early 2002 to implement the recommendations of that report.

A summary of its main recommendations are:-

1. All women in the North Eastern Health Board must have access to a woman-centred quality service which is safe, accessible and sustainable.

2. The North Eastern region should be self-sufficient as far as possible in providing maternity and childcare, offering a comprehensive range of services.

3. The group recommends the establishment of a Task Force whose function would be to develop the recommendations in terms of policies and protocols to be put in place, to process key appointments which have to be made urgently and to plan adaptations to the existing buildings.

4. A level 3 Obstetric unit to be based at Our Lady of Lourdes Hospital, Drogheda, together with the Regional National Intensive Care Unit.

5. A Level 2 Obstetric Unit to be based at Cavan General Hospital together with a Level 2 Special Care Baby Unit.

6. Midwife-led units to be developed in Cavan and Drogheda.

7. The phased opening of midwife-led units in Dundalk and Monaghan as soon as possible.

8. Development of an ambulatory community paediatric out-patient service in Monaghan and Dundalk.

9. A midwife-led unit to be established in Navan as soon as this is judged to be necessary.

10. Provision of a midwifery service in the community separate from the Public Health Nursing service.

11. Provision of shared care in the community between the general practitioner and the maternity services.

12. Additional Consultant appointments in Obstetrics/Gynaecology and Paediatrics.

13. Our Lady of Lourdes Hospital to be approved as a training centre to allow placement of students undertaking the neonatal nursing course.

14. Accommodation at Monaghan and Dundalk to be upgraded/replaced.

C. In June 2002, a protocol was established regarding procedures for "The Management of Emergency Transfers for all Obstetrical Mothers from Monaghan/Navan/Dundalk" (enclosed in the appendix and discussed in Part IV of this Report).

APPROACH TO THIS REVIEW:

1. The Panel held interviews and discussions in Monaghan with:-

- The baby's parents, Ms Denise Livingstone and Mr Barry Kerr
- Matron and Assistant Matron, Monaghan General Hospital
- Two nurses who attended Ms Livingstone in the Treatment Room, Monaghan General Hospital
- Surgical SHO doctor who attended Ms. Livingstone at Monaghan General Hospital
- Night Superintendent, Monaghan General Hospital
- Consultant Surgeon on-call, Monaghan General Hospital
- Consultant Anaesthetist on-call, Monaghan General Hospital
- Obstetrics/Gynaecology SHO doctor who received the baby at Cavan General Hospital
- Consultant Paediatrician who attended the baby, Cavan General Hospital
- Consultant Histopathologist, Cavan General Hospital
- Two Emergency Medical Technicians who transferred Ms Livingstone by ambulance and assisted in delivery of the baby.
- Assistant Chief Ambulance Officer, NEHB
- Chief Executive Officer, NEHB
- General Manager, Cavan-Monaghan Hospital Group
- Corporate Risk Manager, NEHB
- Risk Advisor, NEHB

2. Visited Monaghan General Hospital, the Treatment Room and the now unused delivery suite and investigated available equipment.

3. Studied the NEHB report of 16 December 2002.

4. Reviewed relevant documentation supplied by the NEHB including the file related to the development of the protocol for emergency obstetric situations.

5. Considered other relevant protocols and procedures.

6. Reviewed recent published literature on outcomes following premature delivery.

7. Held further discussions with a Consultant Paediatric Radiologist and 3 Consultant Neonatologists at the Coombe Women's Hospital.

E. ACKNOWLEDGEMENTS

We wish to thank Cornelia Stuart and Irene O'Hanlon for all their help in arranging documentation and interviews. We would like to acknowledge our gratitude to all the people who took time to come and talk to us in what has been a very traumatic week. Finally, we would like to offer our sincerest condolences to Denise Livingstone and Barry Kerr on the death of their daughter, Bronagh.

We have not included an Executive Summary in the Report. Given the significance and complexity of this situation, it is our strong advice that this report be read and considered as a whole.

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Dr Sean Daly

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Ms Bridget Boyd

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Ms Maureen Lynott

20 December 2002.

III CHRONOLOGY OF EVENTS

A. Denise Livingstone woke from her sleep with crampy abdominal pain at around 3.30 a.m. on the morning of 11th December 2002. Her pains were coming regularly. It appears that she had a spontaneous rupture of the membranes (her waters broke). She was bleeding at that time, although the bleeding was not heavy. She woke her sister Tina who called her partner, Mr Barry Kerr, who came to Denise's home. Denise and her sister decided to go to Monaghan General Hospital, as they felt that she was in labour and would not have time to travel to Cavan.

B. Denise and Tina arrived in Monaghan General Hospital at 5.15 a.m. Mr Kerr, who had worked previously in the hospital, knew where the treatment room entrance was and drove there directly. There was no real delay in admitting them, as the night porter who could observe the entrance to the Treatment Room on CCTV from his post came quickly to the door.

C. At that time in the treatment room there were two staff nurses, one of whom had midwifery experience (Staff Nurse A). The staff nurse who had the midwifery experience called the surgical SHO while the other staff nurse (Staff Nurse B) attended to Denise and took her vital signs. The night superintendent was alerted by the night porter and she also attended the treatment room. The surgical SHO arrived and appears to have noted Denise's vital signs and also appears to have palpated her abdomen. Denise complained of feeling a "gush of fluid" vaginally at this time and the midwife checked her pad and noted that it was blood. The surgical SHO did not check her pad and did not examine her further. The surgical SHO asked the staff nurse to arrange transfer to Cavan Hospital and he contacted the gynaecological SHO at Cavan Hospital. Having spoken to both doctors involved, it appears that a very limited history was given over the phone which comprised of the

fact that there was a woman who was 24 weeks pregnant and was bleeding. It was not communicated to the SHO in Cavan whether or not the patient was in labour or whether or not this was a suspected abruption (where the placenta comes away from the wall of the uterus). There was no report of the clinical condition. The gynaecological SHO in Cavan did not ask any questions concerning Denise's condition, nor does it appear that he informed either his registrar or consultant. He seems to have presumed that Denise was 24 weeks pregnant with minimal bleeding.

A phone call to Ambase occurred at 5.20 a.m. and a request for a midwife was also made. The conversation which took place between Ambase and the midwife in Monaghan General Hospital has been recorded (see Appendix). It appears that Ambase asked if a midwife was available and was told that no midwife was available to travel with the patient.

D. At 5.20 a.m., 50 mgs of pethidine was prescribed by the surgical SHO and administered to Denise by Staff Nurse B. At this time, she was getting pains which were coming every three minutes and she felt as though the baby was delivering. It appears she certainly informed the staff that she was feeling pressure and it also appears that she was told to breathe deeply but not to push. At 5.28 a.m., the ambulance arrived at the treatment room with two Emergency Medical Technicians (EMTs). They both appeared to be acutely aware that delivery was imminent and requested that a midwife accompany them in the ambulance. They were told by Staff Nurse A that there was no midwife available. They were also told that Denise was bleeding. At approximately 5.35 a.m., a second injection of pethidine, 50 mgs, was administered intramuscularly. The night superintendent appears to have been in the room at this time and did have a discussion with Staff Nurse A. It does not appear that the night superintendent had a detailed discussion with the SHO or either of her staff. She was then paged and left the treatment room to answer her pager, despite the fact

that a telephone was available in the room. At 5.39 a.m., the ambulance left Monaghan General Hospital with Denise, her sister Tina and two emergency medical technicians. No midwife went with them in the ambulance. Staff nurse A told one of the EMTs to give Entonox en route but she did say that Denise "will not make it to Cavan". She contacted the delivery suite in Cavan General Hospital to give them the patient's history and condition at the time of departure from Monaghan. At approximately 5.40 a.m. the Ambulance Control Centre contacted Cavan to ensure that they were fully prepared to receive the ambulance and services in Cavan General Hospital were mobilized.

E. During the initial part of the ambulance journey, Denise's contractions continued to occur frequently and with increasing intensity. She felt an urge to push and communicated this to the EMT. She was breathing oxygen and Entonox during that time. At 6 a.m. she had a spontaneous breech delivery of a female infant. The baby was delivered initially to the nape of the neck. The EMT present asked Denise to push and with gentle traction delivered the head. The baby was initially flaccid and unresponsive, although when the mouth and nose were suctioned she responded. The baby was wrapped in a blanket and given 100% oxygen via a bag and mask. The cord was not clamped and cut at this time. The driver, who had stopped the ambulance to assist with the delivery and stabilization of the baby, now continued on his journey to Cavan. The ambulance arrived at Cavan Hospital at 6.20 a.m. A paediatric team and an obstetric team were waiting at the door of the Accident & Emergency Department. The cord was cut and clamped and the baby was handed to the paediatric team while the midwifery and obstetric staff looked after Denise. The baby was transferred to a resuscitaire under radiant light and appeared to be in good condition. The baby was making respiratory effort, although she clearly needed intubation and this was done. The initial blood sugar was 5.4, the heart rate 150 b.p.m., oxygen saturation was 98% and the baby was pink. Her temperature was 35 degrees C.

F. Baby Bronagh initially did well with good oxygen saturations and her initial haemoglobin was normal. Surfactant was administered down the ET tube and she was transferred to the Special Care Baby Unit.

While initially Bronagh appeared to do well, she quickly deteriorated and dropped her oxygen saturations. Her blood pressures were very high and she became increasingly difficult to ventilate. She died at 8.55 a.m.

G. A post-mortem was discussed with Bronagh's parents, Denise and Barry, although they did not wish a post-mortem to be undertaken. The Coroner was informed but decided that a post-mortem was unnecessary. The cause of death has been given by Dr Leahy, who was the attending paediatrician, as immature lungs.

IV ASSESSMENT AND CONCLUSIONS

This section will cover our assessment and conclusions concerning:-

A. The Report of the North Eastern Health Board
B. The Emergency Obstetric Protocol and Implementation
C. The Care Delivered to Ms Denise Livingstone
D. The Care Delivered to Baby Bronagh Livingstone
E. Organisational Issues.

A The Report of the North Eastern Health Board

The Report as presented to us on 16 December consists of 20 pages which began with an executive summary which included conclusions. It was followed by an introduction, factual chronology, and areas for analysis; a discussion and analysis of deviations in procedure followed, and the report ended with a final conclusion. Attached with the report are 4 appendices:

(i) List of staff interviewed
(ii) Copy of Procedure for Management of Emergency Transfers for all Obstetrical mothers from Monaghan/Dundalk/Navan
(iii) Memo accompanying procedure when circulated in June 2002
(iv) Transcript of phone call between MGH and Ambulance Control.

The report followed a request by the Minister for Health and Children to the Chief Executive Officer (CEO) of the NEHB, on the death of Bronagh Livingstone, for an urgent investigation. The CEO appointed the NEHB Corporate Risk Manager and the Risk Advisor for the Louth/Meath Hospital to carry this out and to have a report prepared for the Minister and the Independent Review Panel for Monday 16 December. We are advised that the CEO read and approved the report prior to its submission.

In our opinion:

1. It was inadvisable that the NEHB investigation was assigned to be carried out by the Risk Managers for the following reasons: firstly, for a report concerning a tragic incident of this magnitude and the public disquiet concerning it, we believe more senior personnel including clinicians, should have conducted the urgent investigation; secondly, the Risk Management section had responsibility in the NEHB to develop and implement the protocol for emergency obstetrics; thirdly, the fact that the investigating personnel were health risk managers resulted in only one sphere of expertise being applied to the investigation;

2. There was a lack of direction given to the Risk Managers as to what was required of this assignment, but despite this, they managed to interview many of the key people and outline an accurate chronology of events.

3. We are advised that the report was to contain a chronology of facts and events, but there was some confusion as to whether it was to contain conclusions. However, the report does contain specific conclusions put forward by the Risk Managers and submitted by the CEO to the Minister for Health and Children.

4. Regarding the first conclusion of the NEHB report that: "the decision to transfer to CGH was the right one given the condition of the mother and the prevailing conditions on both sites. ": It is our opinion Bronagh Livingstone's birth was imminent shortly after she arrived at MGH. Consequently no attempt should have been made to transfer Ms. Livingstone to CGH prior to delivery. Instead a team from CGH or Drogheda should have been requested to come to MGH as quickly as possible; this event has occurred previously at MGH. In conjunction with this request, personnel such as the Consultant Anaesthetist should have been called in, and the equipment currently existing in

MGH should have been mobilised to stabilise the baby in the event of its delivery and prior to its transfer to a tertiary care facility; this event has also occurred previously at MGH and is common practice in such obstetric emergencies in hospitals where a maternity service is not available. Furthermore, the assertion that the bleeding was a result of a placental abruption (the placenta coming away from the wall of the womb) would, in our opinion, have been a reason not to transfer Ms. Livingstone to CGH.

With respect to the second conclusion that "the outcome to the mother or baby was not compromised by the absence of a midwife during the transfer." It is our opinion that best practice would dictate that either a nurse, or midwife when available, should accompany a pregnant woman to another institution; this has also occurred previously at MGH.

5. In the section of the NEHB Report "Areas for further analysis", and, "Discussion and Analysis Arising from Deviations in Procedure", it is our opinion that the analysis is reasonable, however it over emphasises the roles of individuals and ignores wider aspects which we believe contributed to how this situation was handled.

B The Emergency Obstetric Protocol and Implementation.

1 Assessment of the Protocol and Procedures

The protocol is dated 17 June 2002. We are advised it was developed by a group of midwives and risk managers and that a process of widespread consultation and feedback from clinicians, nurses and managers in the NEHB was involved in preparing the protocol.

(a) While a defined process is laid out in the protocol, we have identified areas in the protocol which are deficient to the needs of emergency obstetrical

situations, in hospitals where a maternity service is not available. These include:-

- **Point 2:** This point concerns the mother's arrival at the hospital. It should be expanded to specify that part of the initial assessment should consist of an evaluation of whether or not delivery is imminent. A history and physical examination should be included.
- **Point 7:** This point concerns where delivery is imminent: It should be substantially expanded with specific details of personnel to be called; where the relevant equipment for the baby is stored and can be accessed; where best the delivery should take place; and identification of a lead clinician when this situation arises.

  Point 8: This point concerns transfer as soon as possible. Accompaniment of the mother/baby in the ambulance by a nurse or doctor should be mandatory. It is our opinion that a clinician in a receiving hospital is not best placed to decide what level of accompaniment in the ambulance is required. Furthermore, the circumstances in which a 'flying maternity squad' should be called out as an alternative to immediate transfer, need to be delineated.

2. **Development of the Protocol:** The protocol was developed by a group consisting of midwives, nurses and risk managers, following wide consultation and feedback within the NEHB hospitals, including circulation for comment to all NEHB Consultant Obstetricians. However no comments were received directly from the Obstetricians, although their views may have been incorporated with the response of Maternity Services Manager. The protocol was reviewed by the Kinder Task Force on Maternity Services in NEHB, on 22 June 2002.

3. **Implementation and Monitoring of the Protocol:** The protocol appears to have been widely circulated and the nursing staff who were interviewed had read and understood it. However, the SHO in MGH

who may have been aware of the protocol, was not aware of the details and therefore did not contact his consultant as specified at Point 2. In addition, the SHO in CGH denies all knowledge of the protocol. Both doctors have told us they would have changed their management if they were more familiar with the protocol.

No on-site discussion of the protocol took place at MGH nor did "fire drills" occur, that is, practice runs using the protocol. Given the importance of applying the protocol in emergency obstetric cases, implementation would need to include information on the protocol and practice runs.

At present, the NEHB is developing an incident reporting system for the Board's area. One is in place in the Louth/Meath Hospital Group since April 2002, but no incident reporting or monitoring system is in place in MGH. There have been six incidents applicable to this protocol prior to Ms. Livingstone's case.

4. The operation of the protocol on the night of 11th December 2002.

(a) It is our opinion that the assessment of Ms Denise Livingstone by the senior surgical doctor and the staff nurse on duty did not adequately anticipate the delivery of baby Bronagh Livingstone.

(b) The surgical SHO on duty failed to inform his consultant.

(c) The surgical SHO on duty in the Monaghan hospital contacted Cavan General Hospital despite the fact that Denise Livingstone was only 24 weeks pregnant. He should have contacted the obstetric registrar in Our Lady of Lourdes Hospital in Drogheda.

(d) There was no decision as to who should accompany Ms Denise Livingstone in the ambulance despite the fact that at interview, all

the clinical staff believe that a nurse and ideally a midwife should have accompanied her to Cavan General Hospital.

(e) The SHO who took the call in Cavan General Hospital was not aware of the protocol and, therefore, was not able to redirect the call to Our Lady of Lourdes Hospital in Drogheda.

C The Care Provided to Ms. Denise Livingstone

1. MGH is located in Monaghan town. It is approximately a 45-minute journey to Cavan and a 70-90 minute journey to Drogheda which have maternity units. The maternity service closed at MGH in March 2001, since then 19 emergency obstetric cases have presented at the hospital, including 6 cases since the protocol was issued in July 2002. There were no deaths amongst these cases. Of the 19 cases, 1 resulted in an emergency delivery and transfer to CGH; this was July 2001 and was the last delivery at MGH. All cases were transferred to Cavan or Drogheda except one which was discharged here after examination, and one which requested transfer to Craigavon. One of the cases involved an emergency ambulance team with 2 midwives coming from Cavan for transfer of the patient and another incident involved an emergency maternity team from CGH travelling to met the ambulance en route from MGH.

2. The treatment room is located at the rear of the hospital and the entrance is monitored by CCTV. The area consists of a single room with two cubicles, each containing a single trolley. Emergency treatment packs and other essential equipment is readily to hand, as is the telephone.

   The unused maternity ward at MGH is located on a floor above the treatment room and can be accessed via the lift located beside the treatment room. The delivery room remains fully

equipped with couch and theatre lighting. The resuscitaire, which is used in the resuscitation of newborns, is located in the delivery room and equipped with a radiant heat source, lighting, suction and ventilation equipment which can be used for either bag and mask ventilation or for full ventilation following intubation. A range of suction catheters, endotracheal tubes are in stock. A modern incubator for warming is also in the room. Located in another room which appeared to be undergoing renovation was a small transport incubator. Antenatal clinics and parent education classes are currently carried out in another room in this area.

3. Care offered in Monaghan General Hospital

When Ms Denise Livingstone presented to Monaghan General Hospital, her vital signs were assessed. An IV line was placed and IV fluid started. Pethedine was given because she was in pain. All of these interventions are consistent with good practice. The surgical SHO did not, in our opinion, adequately examine Ms Livingstone. As a surgical SHO, it would not necessarily be expected that he would do a vaginal examination but he did clinically suspect that a placental abruption may have been taking place. He did not communicate this to his colleague in Cavan. He believed that Ms. Denise Livingstone was going to be accompanied in the ambulance although he did not ensure that this happened. In his interview, he reports that the two staff nurses accompanied Ms Livingstone to the door with the two emergency medical technicians and it was his understanding that one of them was going to accompany her in the ambulance. He was not aware that this did not take place.

The staff nurse who was the most directly involved in the clinical care of Ms Livingstone adequately assessed her vital signs in terms of her blood pressure and pulse. She administered pethedine as prescribed

by the doctor. She did believe that delivery was imminent but did not voice this concern. The second staff nurse who had previously worked in the maternity unit and was a qualified midwife also believed that Ms Denise Livingstone was in labour. She was concerned because of the vaginal bleeding and felt that a vaginal examination should not be undertaken. This is consistent with good midwifery practice. Both nurses did believe that delivery was imminent and the nurse with dual qualification of nurse midwife did communicate this to the ambulance staff.

The night superintendent who was present in the treatment room does not have midwifery training. She did, however, believe that Ms. Denise Livingstone was in labour and that she was going to deliver her baby quickly. She was aware that Ms. Denise Livingstone was bleeding.

It is our opinion that Ms. Denise Livingstone should not have been transferred to Cavan General Hospital. The three members of the nursing staff who were present all felt that delivery was imminent and therefore, Ms. Denise Livingstone should have been kept in Monaghan General Hospital and preparations made to deliver her baby should have occurred. The surgical SHO informed us that he was unaware that Ms Livingstone was in labour but he believed that the bleeding could be consistent with a placental abruption. This in our view, would also be a contraindication to transfer in an ambulance. The surgical SHO should have informed his consultant who, at interview, said that he would have come in and assessed Ms Livingstone.

4. Care provided during transfer from Monaghan General Hospital to Cavan General Hospital:

We are of the opinion that the two emergency medical technicians gave the highest possible care to Ms Denise Livingstone and her newly born baby Bronagh. Both arrived in good condition in Cavan General Hospital and the two emergency medical technicians are to be

commended for the way in which they took responsibility and performed their duties during this emergency.

5. Care delivered to Ms Denise Livingstone in Cavan General Hospital:
On arrival at Cavan General Hospital, Ms. Denise Livingstone was managed by the obstetric team on call which was led by an obstetric registrar. Our assessment of her care during that time was that it was consistent with a good medical and obstetric practice.

D. **The Care Delivered to Baby Bronagh Livingstone**:-

1. The care received by baby Bronagh Livingstone was reviewed and evaluated in conjunction with consultant neonatologists Dr M. Sheridan-Pereira, Dr M.J. White and Dr E. Griffin. There was unanimous agreement that the resuscitative measures undertaken by the Emergency Medical Technician in the ambulance following delivery en route to Cavan General Hospital were in accordance with the Neonatal Resuscitation Guidelines, and that the infant was in good clinical condition on arrival at Cavan General Hospital albeit requiring maximum supplementation with oxygen therapy (100%). The baby's requirement for 100% oxygen would confirm the presence of significant lung disease associated with extreme prematurity.

2. Ambulance personnel notified Cavan General Hospital of their impending arrival with the baby already delivered. The paediatric consultant on-call and all necessary personnel including an experienced neonatal nurse were therefore physically present prior to the baby's arrival. All of the required equipment was prepared in anticipation. The care was therefore consultant led from the moment of arrival with the assistance of a highly experienced neonatal nurse.

On arrival baby Bronagh was active with normal vital signs and an immediate assessment of the baby's oxygenation confirmed a normal blood oxygen level. This clinical profile attests to the baby response to the resuscitation and supportive treatment provided en route to Cavan.

3. The expertise required for the care of baby Bronagh was all in place in Cavan General Hospital and appropriate supportive measures were continued. Subsequently the baby's clinical condition was in keeping with an escalation of breathing distress and the baby required more intensive supportive measures and therapies as the disease progressed. The baby's chest x-rays obtained @ 07^{02} and 07^{12} (age 1 hr 2 mins & 1 hr 12 mins) confirm extensive lung disease of the pre-term baby, which would be expected in the vast majority of newborns delivered at the margins of viability. Unfortunately, the disease of baby Bronagh was of such a severity that she did not respond to the intensive supportive measures that were available and provided on a continuous basis throughout her short life.

   Given that the gestational age was less than 25 weeks this baby's lung disease has two aspects – structural and physiological immaturity. The baby promptly received surfactant which ameliorates the physiological immaturity. The structural immaturity however prevents a greater challenge for baby's survival at gestation less than 26 weeks as most babies only start developing air sac structures for lung gas exchange at 26 weeks.

4. Following discussions with consultant neonatologists, it is possible that Bronagh may have had an intraventricular haemorrhage which precipitated her rapidly deteriorating

condition. The x-ray has been reported by a paediatric radiologist as severe hyaline membrane disease which is consistent with Dr Leahy's assessment.

4. The histopathology of the placenta has been reported as showing a significant placental abruption. This is where the placenta peels away from the uterine wall and this would account for the bleeding which Denise had experienced. It almost certainly was the event that started what was a very precipitous first labour.

In summary: If baby Bronagh Livingstone had been delivered in Monaghan General Hospital, the nurses and doctor all knew what the appropriate steps were in terms of the management of this situation. The consultant anaesthetist would have been called and an incubator would have been obtained from the labour ward. The consultant anaesthetist has certification and training in neonatal resuscitation and would, we believe, have been able to intubate and stabilise the baby. Baby Bronagh could also have been placed in an incubator which was more than adequate to maintain heat in this situation. In actual fact, there was a sophisticated resuscitaire available in the delivery suite which could have been used to ventilate the baby although the consultant anaesthetist who was on call that night was unaware of this. Subsequently, we presume that this would not have been utilised. However, it is our assessment that both the personnel and equipment available in Monaghan General Hospital were more than adequate to initially resuscitate and stabilise a baby like Bronagh Livingstone.

While it could be argued as a result of the expert level of care given by the emergency medical technicians, that the condition of Bronagh Livingstone on arrival in Cavan General Hospital upon transfer in the ambulance did not effect the outcome, we are of the opinion that best practice would dictate that Ms. Denise Livingstone should have been

stabilised and delivered in Monaghan General Hospital and that delivery during transport in an ambulance is not optimal.

Given Bronagh's birth weight, the fact that she was born at 24 weeks and 6 days and the fact that the premature labour appears to have been associated with a placental abruption, her chance of survival would be less than 10%. Unfortunately more than 50% of survivors would have significant disability.

E Organisational Issues

It is our opinion that a number of organisational issues contributed to the circumstances in which this incident occurred:

1. We understand a 'runner' system, where a nurse including midwives, was rostered for emergency ambulance transfers and general substitution duty was discontinued in September 2002. In a situation where MGH continues to be off-call for emergencies, be they obstetric, surgical, medical, etc., it is our opinion that a member of the nursing staff should be designated to accompany transfers to other hospitals and where possible, within the constraints of staff rostering, this person should have the dual qualifications of nursing and midwifery.

2. We formed the clear opinion from our interviews, that the occurrence of possibly emergency deliveries at MGH has not been materially anticipated since the maternity unit closed (although one delivery at term did take place in June 2001). The protocol for emergency obstetric cases places emphasis on transfer of cases, with minimal detail or specifics on procedures and personnel for the eventuality of a delivery; the Treatment Room staff saw their priority as transfer of the mother as quickly as possible, equipment and anaesthetic expertise are available in MGH. It is as if once the maternity unit closed, the understanding and

message was that transfer would occur and that delivery prior to transfer would not be necessary

3. While it is not the brief of this review to in anyway comment on the hospital's status, it is clear to us that the ongoing controversy surrounding MGH is part of the context surrounding this tragedy. We formed the strong opinion that staff are 'caught in the middle' between their employer, the NEHB, local factions within and outside of the hospital, and their loyalty and ties in the community. There is widespread anxiety and mistrust, and not surprisingly, this has effected staff confidence and morale. On the morning of December 11th there was an absence of clinical leadership with decisions not being taken, and with staff being unsure as to who should take charge of this emergency situation.

   The current position for staff in MGH is complex, it has placed staff in a highly charged environment for an extended period of time. In such circumstances there is vulnerability to error. We are advised that there is a current process of external facilitation at MGH underway for the last 6 weeks regarding clinicians in management, and staff have been involved in discussions regarding plans for the hospital. However, it has been confirmed to us by management and staff that no other form of facilitation or organisation development/change management has taken place at MGH since the maternity unit closed in March 2001. There have been many service changes at the hospital since March 2001 and further changes are proposed. Given the extent of the changes and the conflicted situation staff are working within, it would seem to us an expert process is essential to address the following areas: support to staff, communications within the hospital and with management, and changed working arrangements and processes.

4. MGH and CHG form the Cavan/Monaghan Hospital Group under a General Manager who reports to the Assistant CEO for Acute Hospital Services in the NEHB. The General Manager has a management team

of 5 with responsibility for both sites. (Director of Nursing, Finance, Personnel, Administration etc). All 5 are based at CGH and no member of MGH is on the management team. At MGH, the Matron has responsibility for nursing staff and she reports to the Director of Nursing for the hospital group; the Administrator has responsibility for clerical support staff and reports to the Group General Manager. Thus there is no on-site integrated manager for MGH as a whole.

The fact that all hospital managers are sited at CGH and none at MGH, and that there is no on-site integrated management does not seem appropriate or constructive especially given the difficult circumstances surrounding MGH at this time, and the need to foster organisation cohesion and support to staff at the Hospital.

5. There is a widely reported comment concerning this incident that we have found in our review to be incorrect, that is that staff may have feared reprimand while dealing with Ms Denise Livingstone. We have interviewed each member of staff who dealt with Ms Livingstone and are assured that their actions were not predicated upon fear of reprimand nor have they experienced reprimand in the past.

V RECOMMENDATIONS

The objective of these recommendations, which we consider should be implemented immediately, is that the care provided to pregnant women who present in emergency circumstances to MGH is consistent with best practice and best patient care.

A. Protocol for emergency obstetric cases:

(1) There should be a fundamental review of the protocol by a team which would include not only midwives, nurses and risk managers but also consultant obstetricians, paediatricians, surgeons and anaesthetists. The revised protocol should include detailed procedures to be taken when delivery is imminent.

(2) The implementation of the revised protocol should include a joint meeting to discuss its operation with involved multidisciplinary staff at each facility. Each member of staff should be required to sign and date a form indicating that they have read and understood the protocol. Review meetings should be held within each facility to assess the operating of the protocol and joint working. Fire drills or practice runs in applying the protocol should also occur.

(3) Each maternity incident occurring in MGH should be reviewed by a multidisciplinary team within the Cavan Monaghan Hospital group.

B. The hospital should re-institute the “runner” system previously used, so that a nurse or nurse/midwife is available for ambulance transfer of emergency cases.

C. A "Flying squad", that is, an expert multidisciplinary team should be in place to assist and backup emergency cases where delivery is imminent or a mother or baby are at risk. The availability of such a flying squad will demand that adequate non-consultant hospital doctors are rostered on a 24-hour basis in order to facilitate a situation where either a registrar or consultant can become part of the flying squad team. It is our opinion that this service should be provided centrally from Drogheda as this is the tertiary referral centre within the Health Board area.

D. Adequate facilities for delivery and management of a pre-term infant must remain at MGH.

E. Management capability and structures for MGH should be significantly enhanced. An on site manager should be appointed for Monaghan General Hospital. All personnel on that site should report to this manager, who should be whole time located within MGH, and who should be a member of the management team of the Cavan Monaghan group.

F. An expert process of facilitation involving organisational development should be implemented at MGH. The objective of this process should be to create an environment in which the staff of Monaghan General Hospital are supported and feel they have an important role in the delivery of health-care services in the North Eastern Health Board, and that roles and responsibilities are understood.

APPENDIX

- **North Eastern Health Board Procedure "Management of Emergency Transfers for all Obstetrical Mothers from Monaghan/Navan/Dundalk".**
- **Transcript of Ambulance Conversation 11 December 2002.**

Acute Hospitals Services – Office of the Deputy CEO	
MANUAL Policies Manual	**Reference AH/PM/O1** **Page 1 of 3** **Revision 1** **Date 17/6/02**
PROCEDURE Management of Emergency Transfers For all Obstetrical Mothers from Monaghan/Navan/Dundalk (unannounced)	**APPROVED** Dr A McLoughlin, D/CEO Acute Hospital Services, Cornelia Stuart, Corporate Risk Manager

Note: This procedure is in place in the absence of any obstetrical service being available at the above sites and in the event of a mother in labour/in need of urgent admission attending. It is written in the understanding that there will not be practicing midwives or obstetric staff on site.

All pregnant mothers should be advised at ante-natal clinic of the fact that no obstetrical services are available on the Navan/Dundalk/Monaghan sites and that should they require urgent care they should not attend at these sites. GP's within the catchment area of the hospital sites should also be advised of this fact.

Despite this advice should a pregnant mother attend at the A & E Department/Treatment Room on the Cavan/Dundalk/Monaghan sites the policy is to ensure that they are stabilised and transferred as rapidly and safely as possible to a site where care can be delivered safely.

It is important to note that in the absence of any obstetrical and midwifery expertise that all assistance provided by medical and nursing staff is in accordance with the principle of providing limited emergency medical care.

Scope: To describe the procedure followed by Medical and Nursing Staff to affect the transfer of unannounced obstetrical patients from Monaghan/Navan/Dundalk Hospital sites.

Applicable to: All mothers attending unannounced and in need of immediate obstetrical care.

Background: There are obstetrical services currently available at only two of the NEHB's acute hospital sites (Cavan and Drogheda) and in the event of a patient attending in need of immediate attention at one of the other sites (Monaghan, Dundalk or Navan) a procedure is necessary to assure a smooth and timely transition.

Application of the following procedure should be followed sequentially for obstetric mothers presenting to a hospital without an obstetric service.

Procedure:

1. On arrival at the hospital the mother will be taken to the A & E Department\Treatment Room.

2. The senior nurse on duty in the A & E and the most senior surgical doctor immediately available must be called to the A & E/Treatment Room. Immediate and urgent triage and assessment is provided to the mother. The attending doctor must arrange to immediately inform his/her consultant of the event.

3. Nurse on duty to contact Ambulance Control and advise that an ambulance is required immediately to transfer an obstetrical emergency.

4. Nurse on duty to establish clinical details, personal details and record base line observations as per Obstetrical Transfer Form.

5. For mothers arriving at Monaghan Hospital contact Labour Ward at:-

    (i) Cavan General Hospital (phone 049-4361399) re: mothers whose baby's gestation age >32 weeks.
    (ii) Our Lady of Lourdes Hospital, Drogheda re: Mother's whose baby's gestational age <32 weeks. Phone 041-9837601 (main switchboard and ask to be put through to the Obstetric Registrar on duty – indicate the urgency and if he/she is not immediately possible to locate ask to be put through the labour ward CNM2).

For mothers arriving at Dundalk or Navan Hospitals contact Obstetric Registrar on duty at:

    (i) Our Lady of Lourdes Hospital, Drogheda – phone 041-9837601 (main switchboard and ask to be put through to the Obstetric Registrar on duty – indicate the urgency and if he/she is not immediately possible to locate ask to be put through the labour ward CNM2).

The following information should be communicated:

    1. Information re: Mother's personal\clinical details
    2. Information re: Mother's baseline observations.
    3. Seek advice re: Specific medical/nursing care prior to transfer.

(The above may be undertaken by Nurse or doctor on duty and documented in full).

6. In the event of the accepting Hospital giving instructions regarding medical intervention e.g. citing IV access, medication, etc; this will be done Doctor-to-Doctor and supported by the appropriate documentation.

7. In the event that delivery is inevitable prior to transfer, the attending doctor(s) and nurse(s) will assist with the delivery and after care of mother and baby in accordance with the principles of providing limited emergency medical care.

8. Transfer mother/baby via ambulance to Cavan/Drogheda will take place as soon as possible. Staff to accompany mother/baby will be determined by the mother's baby's medical needs and in accordance with the instructions of the doctor at the accepting Hospital. The baby will travel in an incubator. Information of the mother's/baby's clinical details, treatment administered and supply copy of documentation to date including birth registration form (a copy of the delivery sheet and transfer form to be retained at the transferring site) will accompany the transfer. The baby's birth registration to be completed by the staff member who delivered the baby.

9. Nurse to contact receiving Obstetrical Unit and advise re. Time of departure and mother's/baby's status. This must be recorded and include time and name of referring and receiving nurse.

Transcript of Prolog Tape Re Maternity Transfer

From Monaghan to Cavan

On 11 th December 02 at 05:22 NEHB Ambulance Control received the following call. *AlC*

Ambulance service Tommy speaking.

M/H Hello this the treatment room in Monaghan here we have a girl for transfer to Cavan she is in labour 25 weeks pregnant.

AlC 25 weeks?

M/H Yes bleeding

AlC She is haemorrhaging is she?

M/H Yes

AlC Is she in labour?

M/H She is having strong pains

AlC Are you sending anyone with her?

M/H She needs a midwife we don't have a midwife

AlC You don't have a midwife

M/H No

AlC OK that's fine, sorry what's the lady's name?

M/H Denise Livingstone

AlC OK and she is in the treatment room, have you been in contact with Cavan?

M/H Yes.

AlC = Ambulance Control M/H = Monaghan Hospital
